

10/525128

Rec'd PCT/PTO 18 FEB 2005

Device to influence gas flow

With patients suffering from pulmonary diseases, aerosols are often used for therapy.

Special difficulties arise with the utilization of aerosols with patients receiving artificial respiration. Either compressed-air operated nozzle foggers or foggers producing aerosol continuously, such as e.g. ultrasound foggers or piezoelectric foggers are used. The nozzle foggers are normally placed in the common end segment for inspiration and expiration of the artificial respiration hoses, shortly before the tube barrel and are controlled via the artificial respirators, so that they are active only during inspiration. The fogger is however active until the end of inspiration, so that in the overall hose system distal gas enriched with aerosol is present in the fogger, so that the dead-space volume is also provided with aerosol. Thus it is possible as a rule to place a bacterial filter between the inspiration or expiration legs and the tube barrel, playing also a role in humidifying the respiratory tracts. The heavy humidification of the non-utilized gas column (dead space volume), mostly with large aerosol particle, causes the filter to become filled with liquid and thus loses its antibacterial effect on the one hand, while on the other hand the resistance of the filter increases so much that it closes up.

The continuous foggers such as e.g. ultrasound foggers or piezoelectric foggers produce smaller particles (average size less than 7 µm) that reach the point of utilization more easily, resulting in fewer side effects and lower drug costs. However these devices can only be placed in the inspiration leg of an artificial respirator since they produce aerosol continuously and would thus convey aerosol to or from the patient during the inspiration

as well as during the expiration phase. A filter would therefore fill up and lose effectiveness or close up. By omitting a filter, insufficient humidification of breathing air is obtained so that a breathing-air humidifier has to be used which, in addition to costs, also involves a hygienic problem (nosocomial pneumonia)

The object of the invention is to create a device in combination with aerosol-producing foggers by means of which the problems described above can be avoided.

This object is attained by the characteristics indicated in claim 1 by means of the device for the control of the direction of gas flow with foggers and in inspiration and expiration ranges of a respirator, whereby a bypass device is provided conveys the aerosol as the gas flows in one direction and takes it through a bypass past the fogger as it flows in the other direction.

The object can also be attained by the characteristics indicated in claim 2 by means of the device to direct the gas flows in foggers in the inspiration and expiration phases of a respirator by means of a valve that is time-controlled by the respirator and closes before the end of inspiration in function of the volume of breath intake, the duration of inspiration and the pressure of inspiration so as not to fill the dead space volume with aerosol.

My invention makes it possible to place the fogger (any fogger can be used) between filter and tube barrel without breathing air humidifier at the common end segment with